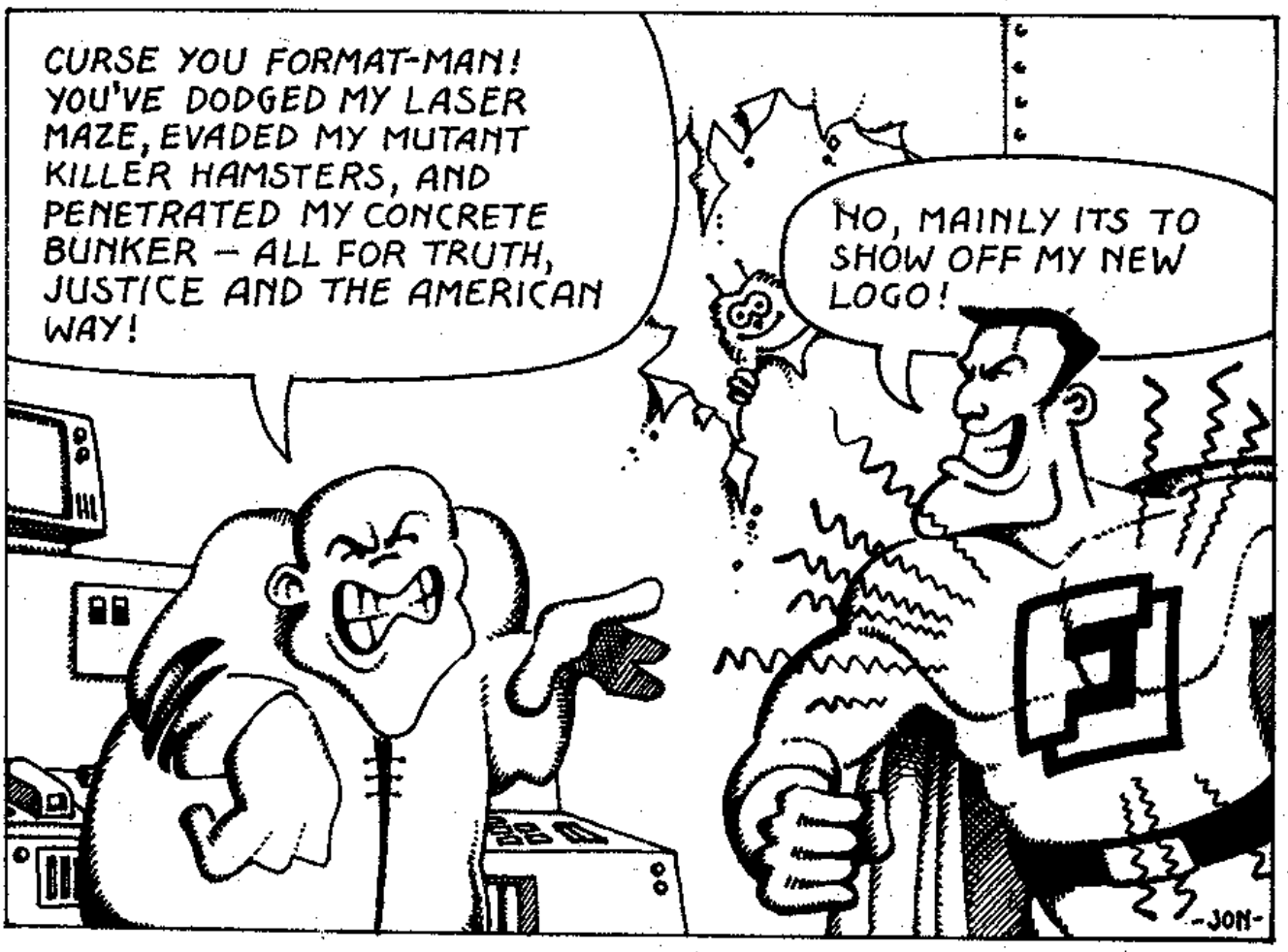
Vol.5 - Nº 2. October 1991.

FORMAT

FOR SPECTRUM AND SAM USERS



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NEWS ON 4

NCE'S BLOW TO 8 BIT READERS

New Computer Express, Britain's only surviving weekly magazine for home computer users, has dropped a bombshell on 8 bit computer users.

In a move to infiltrate themselves deeper into the 16 bit field they have nearly doubled their cover price so they can include a 3.5" disc with each issue. The disc includes programs for ST, Amega and IBM PC computers but would make a very expensive blank disc for other computer users.

While the rather small Spectrum and SAM coverage they have been giving in recent issues it can't be long before they drop the Spectrum column altogether.

ARTIST II RETURNS

Friday the 13th of September was far from being an unlucky day for Spectrum users. That was the day that Format Publications announced that we are to relaunch of the ARTIST II graphics package for the Spectrum.

Long recognised as the best art package ever produced for the Spectrum, ARTIST II will soon be available on DISCiPLE/PLUS D 3" or 5" 80 track disc or DISCOVERY 3" disc, all versions priced at 19.95 (16.95 to INDUG members). Both the 48k and the 128k versions of the ARTIST II are included on the same disc along with a page-maker utility, sprite designer and several extras. A new, easy to follow, A5 manual has been produced for the package by graphics guru Carol Brooksbank.

For more details see next months issue of FORMAT.

NEW PRE-CHRISTMAS SHOW

South Wales is to get its first computer show for nearly six years. To be held at the Afan Lido in Port Talbot on Sunday 1st December the SOUTH WALES COMPUTER FAIR is a joint venture between several local companies and a local newspaper.

The venue is on the sea front at Port Talbot, not far from the M4 motorway with ample free parking beside the show or just round the corner. Entry on the day will cost adults £2.50 and under 14s £1.50 but FORMAT readers can obtain advance tickets by post and save 50p per person (see advert in this issue).

The show will be advertised on local television, in local papers and in national magazines. A 6' stand costs £50 plus VAT. For further details ring 0792 310865 between 2 and 4pm weekdays.

SAM GOES 512

In a surprise move SAMCO have announced that they are dropping the 256K SAM Coupé in the UK. In future only the 512K version will be available but this will be at the same price (£199.99) as the 256K was.

The 256K upgrade has been reduced in price to £29.95 (a £10 reduction) at the same time. Alan Miles told FORMAT that the move had been prompted by the falling prices of memory chips. He also pointed out that most UK customers had been buying the 512K machine anyway so this change would save SAMCO from the need to keep dual stock piles. The new SAM will also be changing its colour in the near future.

As a special first birthday offer SAMCO sold the new SAM package at two recent All Formats Shows at an extra special 'cash and carry' price of just £150.

NEWSFIELD CRASH

The shock news has been announced that Newsfield Publications has been placed into liquidation. Newsfield, publishers of CRASH; ZAPP 64; The Games Machine and Raze, had been a major presence on the computer scene for over seven years.

Kidsons, Impey & Partners (061 236

7733) have been appointed as liquidators by Newsfields management and all staff have been made redundant. Kidsons are preparing a set of accounts to be laid before a creditors meeting but at the time of going to press no indication as to the date of the meeting nor how much Newsfields debts amount to has been given.

At one time CRASH had the largest circulation of any of the Spectrum magazines, but in resent years it had shrunk both in size of issue and in readership. However in the last few months the magazine had begun to drag itself out of the dumps and had been giving some good coverage on the SAM front as well.

Neither of the other two high street Sinclair magazines - Your Sinclair and Sinclair User - would comment on the death of CRASH. A few advertisers we were able to contact all said they were sad to see Newsfield close.

MICRONET CLOSING DOWN

Micronet, the home computer section of PRESTEL, is to close down at the end of October. British Telecom who run PRESTEL say that the closure is to allow resources to be concentrated on its business users.

Micronet has long suffered from a shortage of advertising to subsidize the system and BT have had to increase on-line charges in the past to keep the service running.

Existing subscribers are to be offered one months free access to the Compuserve system as an alternative. But as on-line charges are more expensive on Compuserve this will leave most users relying on independent bulletin boards in the future. Still, as there seem to be so many of those around at the moment modem users will have plenty to do.

News Credits: Brian Gaff, Ken Elston, David Barker.

URGENT we need your news. Anything you think other people should know about. Items printed earn contributor 3 month extra subscription (please claim when renewing).

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Sunday December 1st

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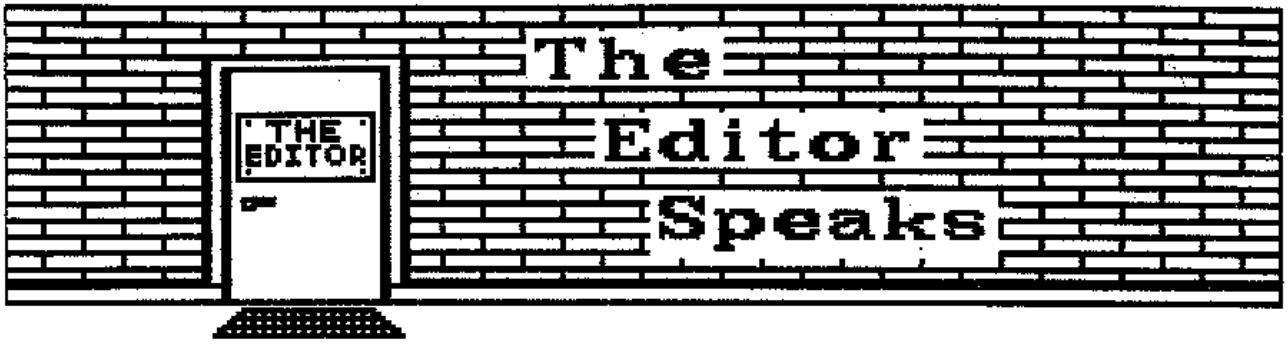

I made the mistake of going on holiday in September. I thought it would be a quiet time of the year so a week in Italy would be OK provided I got back in time to produce this issue of FORMAT. Little did I know that all hell was going to break loose while I was away. Just look at this months NEWS ON 4 and you will see what I mean.

By the time you read this the Summer Subscription Drive will be over, next month we will announce the result. In the meantime I can announce that as things have been so successful I want to keep the ball rolling. So it may be goodbye to the Summer Membership Drive but keep those new members coming as we start our new Winter Membership Drive, Jenny will be giving you full details next month but don't let that stop you sending in membership forms in the meantime.

I have had quite a lot of members ringing up over the last month complimenting us on the new look cover to FORMAT. I'm glad you like it, the colour will not always be red - we will ring the changes, but I am pleased with the new image and it seems most of you are as well.

There are several new sections due to start in FORMAT over the next few months. PERSONAL VIEWPOINT will allow people to air their personal views on the computer scene in a longer form than could be allowed in the letters page. If anyone has any views they would like to get across then give us a ring and we will tell you how to make a submission. Z80-SUBS is a new column aimed at Z80 machine code programmers, in a way a little like the highly successful SHORT SPOT but totally devoted to machine code. Bill Nicholls, who will be acting as sub-editor on the new column, is looking for small Z80 routines to fill his pages. Send any items you have to hic at the normal FORMAT address, make sure you give a clear indications of what the routine does and how it works. I am also looking for someone to run a column concentrating on hints and tips for games players. Not just cheat pokes, but hacking and converting as well. Come on readers - there must be someone who thinks they can manage a column like that.

There are now so many All Formats computer shows going on that it is just impossible to go to all of them. Nev Young was kind enough to give up his free time (and I know he doesn't have much these days) to do the recent Leeds and Glasgow shows for me. I missed the Birmingham show because of holiday but hope to be at the Bristol show on the 6th October and at the London show (3rd Nov) and Birmingham (10th Nov). I also plan to do the new South Wales Computer Fair on the 1st Dec. That is about as far ahead as I can plan at the moment but I hope to see lots of you there.

One last thing. On Monday 23rd September the Royal Mail Parcel Force delivered a large plastic bag. Inside was the remains of a package addressed to us and post marked Eakring Road, Mansfield, 17th Sep. Only the brown paper packing reached us. If anyone out there knows anything about it could they give me a ring as I would really like to know what the post office have managed to loose this time.

Bob Brenchley. Editor.

SAM MasterBASIC

It's here! The program that gives your Coupé a host of new and extended commands and functions for Sound, Graphics, Editing, File compression, Data-handling and Printing!

HIGHLIGHTS:

- **INTERRUPT-DRIVEN SOUND SYSTEM. Allows complex tunes and sounds to be generated as a "background" task.**
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- **FASTER MERGE and DIR (drive). When used with MasterDOS, boosts RAMdisk speed and enhances INP$, DIR$, FSTAT, OPEN etc. When used with the SAMBus, supports precision timing with the clock.**
- **SEARCH AND/OR REPLACE. List, change, edit variable names, strings, procedure names, keywords etc. Fast and flexible.**
- **LIGHTNING-FAST ARRAY SORT. 200 strings SORT in under half a second! SORT any part of an array on any substring. Case sensitive or insensitive options.**
- **LIGHTNING-FAST ARRAY SEARCH. Search 1000 strings in a third of a second.**
- **JOIN arrays or strings. DELETE parts of arrays or strings, EDIT existing variables, FORMAT numbers with USING$, CASE CONVERSION, SEARCH memory and MANY MORE FEATURES!**

The program requires ROM 20 or later, and SAMDOS or MasterDOS. It combines with DOS to give a convenient BOOTable file. The new features are fully explained in a 50-page manual, and the disk includes example programs.

MasterBASIC *costs just £15.99 inclusive of postage and packing. (£16.50 in Europe, £17.00 elsewhere.)*

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SHORT • SPOT

By:- John Wase.

I am told that as one gets older, time passes quicker. I guess I've aged a century in the last twelve months - "Short Spot" time again, and it only seems like a few minutes since I did the last. Indeed, I'm a bit late, finishing this, but I had to take some time off to go to the All Formats Fair up in Birmingham. And what a cracker it was. I got a load of front cover Atari magazine 3.5" discs, once duplicated, never used, for 20 pence each. Now there's economy! And a pile of 3" discs for my ageing Spectrum+3; returns with games on; twenty-five for a tenner. Most of them work, too, provided you can get them formatted. "Easy", I hear you cry. "Stuff the disc in and enter" FORMAT "a:". Trouble is, you've put in an Amstrad CPC disc. "Error 6; Unrecognised Format" wails the Speccy. "Format "a:", you brute". "Unrecognised Format" retorts the +3. And so on... You can win this battle of wills if you take one of your best, formatted discs and put it in. "FORMAT "a:", you tell it. "Disc is already formatted. A to abandon, other key to continue". Remove your precious disc and insert the recalcitrant one. Hey Presto! Yes, I know I've mentioned this before. But with +3's at £75.00 a go, and loads of these returned discs around, you might be tempted...

Next, an apology. P. J. Williamson writes that he sent me a cassette, and has heard nothing. He's quite right. I tried several times to load the cassette, it failed, and I put it on one side. Now I can't find it for love nor money. I've put it somewhere safe. Please, I grovel, and will you send me your address; I'll send you a couple of discs so that we can start again. (Sod's law - when once it goes wrong, it goes very wrong).

Next, a little program for SAM. Peter Morgalla, who has written before from Hemel Hempstead, Herts, mentions that he has been playing with the various font programs now available. Unfortunately, most of these fonts are saved as code comprising several consecutive blocks of bytes coding for several different fonts. Unless you know what you are doing, it can be a tortuous job to load an individual set. So here's a program to do it for you. The routine loads in the code block (which may contain several separate fonts) and then resaves the selected font at address 20880. Load this in as part of a SAMprogram, and new characters appear as if by magic. The font can be saved at any selected address by altering the variable "start", and it can also be used by Spectrum programs running under SAM emulation. Many emulators are loaded in SAM at 65536. The character set in the Spectrum is written in ROM, so if you're using a Spectrum, tough: all you can do is load your new set into RAM and alter the pointer CHARS to point to the appropriate area of RAM. Once in SAM's RAM, however, you can load the character set in direct, without the bother of manipulating the CHARS system variable. The Spectrum character set starts at Spectrum address 15616, so in SAM emulation, it is a simple matter to load a new font at this address, remembering the 65536 offset. LOAD <name> CODE (65536+ 15616); that's all there is to it.

```
10 REM       FONT LOADER
20
30 REM   BY PETER R MORGALLA
40
50 CLEAR 32767: LET loadaddr=32768,
   leng=768 ,start=20880
60 CLS : PRINT AT 10,7;"INSERT DISC
    TO LOAD"; AT 12,11;"PRESS A KEY
   ": PAUSE 0
70 DIR 1
80 INPUT "NAME OF CODE BLOCK TO LOA
```

```
    D"'A$
  90 LOAD A$ CODE loadaddr
 100 INPUT "FONT NUMBER WITHIN BLOCK"
     'A
 110 LET font=loadaddr+(A*leng-leng)
 120 LET B$=MEM$(font TO font+leng)
 130 POKE start,B$
 140 INPUT "ENTER NAME TO SAVE SELECT
     ED FONT"C$
 150 CLS : PRINT AT 10,7;"INSERT DISK
      TO SAVE"; AT 12,11;"PRESS A KEY
     ": PAUSE 0
 160 SAVE C$ CODE start,leng
9998 STOP
9999 DEF PROC SA: POP : SAVE "FONTLOA
     D" LINE 10
```

Peter has used the routine successfully with the Format Font Library, the font blocks on Lettahead and Steve's Software SC_Filer. Many thanks, Peter.

Versions of Bigletters still continue to arrive. Clive White of Frome, Somerset has sent one (again for the SAM). Unfortunately, it's a huge spaghetti program/demo. I sat for half an hour, watching it write things in fancy letters all over the screen. So I've asked him to send in a short snappy file for "Short spot", and the big one full of fonts, with a font designer, a fully blown demo and all sorts of other bits and pieces we'll try and include on a disc which I'm compiling called "Best of "Short Spot"". There, that's let the cat our of the bag, hasn't it... What do readers think about the idea?

Back to the Spectrum. Bjorn Nyberg of Lennoxtown, Glasgow, writes with a quickie. The "SnapRename" program in the August issue of "Format" can be improved to take care of multiple snapshots (for instance if you've snapshotted a compilation) by adding REM to lines 120 and 130 (or deleting them) and adding the following lines:-

```
150 PRINT #0;"Do you want to rename a
    nother Snapshot?": GOSUB 9000
160 IF k$="n" THEN STOP
170 GOTO 15
```

It's also a good idea to rename the program itself "RenameSnap" as this prevents problems when you are trying to erase one or more programs using wild cards.

Although Bjorn, like me, loves utilities, he also, for once, has included a different sort of program. The idea originally came from an old issue of "Sinclair User" (April '84). Bjorn typed in a program on AI (Artificial Intelligence) by J. McAllister, but found it limited in scope, and it didn't work very well. So Bjorn, being Bjorn rewrote it. You play a simple game against the computer, which starts by being totally ignorant and acting randomly, but which learns from its mistakes, learns the game and eventually becomes unbeatable. Removing the REM from line 290 lets you check the progress of the game (and the computer). Here it is:

```
 50 CLS : PRINT "This is an AI simula
    tion of the simplest kind."''"YOU
     play against the computer. Ther
    e are 21 markers on the     table
    . A player may choose to   take 1
    , 2 or 3 at each turn."
 55 PRINT '"The player who takes the
    last   marker LOSES."
 60 PRINT '"YOU always start. The com
    puter  should thus theoretically
    alwayswin by taking 4 less the nu
    mber you just took."
 61 PRINT #0;"Press SPACE": PAUSE 0
 65 CLS : PRINT '"Example: 1st player
     takes 2; 2ndtakes 2. 1st takes 3
    , 2nd takes 1 and so on. This giv
    es 5 roundsof 4, leaving 1st play
    er with   the last marker to take
    ."
 70 PRINT '"The computer is totally w
    ithout experience as a player. It
     will,however, learn from its mis
    takesif it makes the wrong move i
    n   a round - and loses."
 71 PRINT #0;"Press SPACE": PAUSE 0
 72 CLS : PRINT '"It will then recall
     the first   wrong move it made a
    nd adjust   its strategy accordin
    gly, but   only if it LOSES the g
    ame in    progress."
 75 PRINT '"It will not commit the er
    ror of taking too few or too many
          markers if there are four o
    r    less left, though YOU should
        watch that YOU don't!"
```

```
 80 PRINT '"If the computer wins a ga
    me, it has learned nothing from a
    ny    mistakes it might have made
     in  that game."'"To lose a game
     is the only way  for the compute
    r to learn the    lesson!"
 82 PRINT #0;"Press SPACE": PAUSE 0
 83 CLS : PRINT '"When the computer h
    as learned    enough, it becomes u
    nbeatable."
 85 PRINT '"Try!"
 90 PRINT '''"(Based upon an article
     by        J McAllister in Sinclair
      User   April 1984)"
 95 PRINT #0;"Press SPACE to start":
    PAUSE 0
100 LET intlx=0: LET intly=0: GOSUB 9
    00
110 CLS : LET rest=21: FOR n=1 TO 6
120 INPUT "Input your number: ";a: IF
     a>3 OR a<1 THEN GOTO 120
130 LET rest=rest-a
140 PRINT '"Your number is ";a;TAB 21
    ;"Rest: ";rest
150 IF rest<1 THEN LET rest=0: GOTO 2
    30
160 IF rest=1 OR rest=0 THEN PAUSE 1:
     PRINT '"YOU WIN!": PRINT '"Press
     a key to continue": PAUSE 0: GOT
    O 300
170 LET b=INT (RND*3+1)
180 IF intlx AND a+b>4 THEN LET b=4-a
190 IF intly AND a+b<4 THEN LET b=4-a
200 IF rest<=b THEN LET b=rest-1
210 LET rest=rest-b
220 PRINT "Computer input: ";b;TAB 21
    ;"Rest: ";rest
230 IF rest=1 OR rest=0 THEN PRINT '"
    COMPUTER WINS!": PRINT '"Press a
    key to continue": PAUSE 0: GOTO 4
    00
250 IF a+b>4 AND fault=0 THEN LET cor
    rx=1: LET fault=1
260 IF a+b<4 AND fault=0 THEN LET cor
    ry=1: LET fault=1
290 REM  PRINT "corrx=";corrx;";corry
    =";corry;";intlx=";intlx;";intly=
    ";intly
299 NEXT n
300 IF corrx=1 THEN LET intlx=1
310 IF corry=1 THEN LET intly=1
400 GOSUB 900: GOSUB 1000
410 IF k$="y" OR k$="Y" THEN GOTO 110
420 GOTO 9999
900 LET corrx=0: LET corry=0: LET fau
    lt=0: RETURN
1000 CLS : PRINT "ANOTHER TRY? Y/N": P
    AUSE 0
1010 LET k$=INKEY$
1020 IF k$="y" OR k$="Y" OR k$="n" OR
     k$="N" THEN RETURN
1030 GOTO 1000
```

Back to SAM, now. Simon Brooks of Shoreham-by-Sea, West Sussex, sends us this nice little scrolly program. You put in a message and it scrolls it across the screen. Lots of possibilities here, particularly with MasterDOS: for instance the larger characters from CSIZE, but to accommodate these, you'll have to alter the 31 in line 70 and the variables in line 90.

```
  1 REM *****SIMON BROOKS 1991 *****
  2 REM ***** SCROLLING PROGRAM ****
 10 MODE 4: CLEAR : CLS #
 20 LET w=PEEK SVAR 54
 30 INPUT #2;"MESSAGE="; LINE mess$:
     LET mess$=mess$+"              ":
     REM space between message
 40 INPUT #2;"Line Number=";h
 50 CLS
 60 FOR L=1 TO LEN mess$
 70 PRINT AT h,31;mess$(1)
 80 FOR S=1 TO 8: REM letter space
 90 SCROLL 1,1,0,173-w*h,257,w
100 NEXT S: NEXT L
110 GOTO 60
```

PRINT USING refuses to lie down and die. Roy Burford writes again to point out that the program he sent was 98% Geoffrey Smith's (Fleet, Hants), with the transcription error in line 160 corrected. Sorry, Roy.

Now a beauty on the DISCiPLE/Plus D for printing graph paper. Malcolm Perry of Kidderminster has sent it in. It's set up for a Star LC10 and he recommends an older ribbon in the printer. The results he enclosed are superb: I can't check it, I'm still waiting for my Plus D printer port repair. Don't forget, it will need modifying for different types of printers and particularly for 24 pin types. He's got it set up to print eight little faint squares per big square, so that you can use it to design characters or screens, but you can use it for any sort of linear graph paper. Here it is:

```
  1 REM GRAPH PAPER PRINTER
  2 REM BY MALCOLM PERRY
  9 REM this program will alter syste
    m and printer. Reset after use
 10 PAPER 6: INK 1: BORDER 4: GOSUB 9
    00: LET l=8: LET w=8: LET sx=10:
    LET sy=10
 15 GOSUB 1020: PAUSE 0: LET a=CODE I
    NKEY$: IF a=13 THEN GOTO 40
 20 LET ds=10: LET C$="SUBDIVISIONS":
     LET B$="X": GOSUB 870: INPUT A$:
     GOSUB 810
 21 LET B$="Y": GOSUB 870: INPUT A$:
    GOSUB 820
 22 LET ds=8: LET B$="X": LET C$="GRI
    DS": GOSUB 870: INPUT A$: GOSUB 8
    30
 23 LET B$="Y": GOSUB 870: INPUT A$:
    GOSUB 840: GOSUB 850
 40 CLS : FLASH 1: PRINT AT 10,7;"PRI
    NTER NOT ON !": POKE @6,1: LPRINT
     CHR$ (27);"1": POKE @6,0: FLASH
    0: GOSUB 800
 50 POKE @42,27: POKE @43,42: POKE @4
    4,6
 60 POKE @5,100: POKE @7,6: POKE @9,0
 70 LPRINT ''''
110 FOR y=1 TO w*sx: LPRINT "B";: NEX
    T y: LPRINT : REM graphic B
160 FOR v=1 TO 1: FOR z=1 TO sy-1: FO
    R y=1 TO w
200 LPRINT "D";: REM graphic D
240 FOR x=1 TO sx-1: LPRINT "C";: NEX
    T x: NEXT y: REM graphic C
300 LPRINT "A": NEXT z: REM graphic A
360 FOR y=1 TO w: LPRINT "F";: REM gr
    aphic F
400 FOR x=1 TO sx-1: LPRINT "E";: NEX
    T x: NEXT y: REM graphic E
460 LPRINT "A": NEXT v: REM graphic A
500 CLS : PRINT AT 10,10;"ALL DONE":
    STOP
800 CLS : PRINT ''''''"          NOW PR
    INTING"''''"          PLEASE WAIT":
    RETURN
810 IF CODE A$=0 THEN GOTO 819
812 LET gt=810: GOTO 850
813 LET SX=VAL A$: IF SX>88 THEN LET
    SX=88
814 IF SX<1 THEN LET SX=1
819 RETURN
820 IF CODE A$=0 THEN GOTO 829
822 LET gt=820: GOTO 850
823 LET Sy=VAL A$: IF Sy<1 THEN LET S
    y=1
829 RETURN
830 IF CODE A$=0 THEN GOTO 839
832 LET gt=830: GOTO 850
833 LET W=VAL A$: IF W<1 THEN LET W=1
834 IF sx*w>88 THEN CLS : PRINT ''''"
                ";W;" IS"''''"
     TOO WIDE FOR PAPER"''''"       R
    EDUCE VALUE BY  ";(INT (((SX*W-88
    )+.9)/SX)): INPUT A$: GOTO 830
839 RETURN
840 IF CODE A$=0 THEN GOTO 849
842 LET gt=840: GOTO 850
843 LET L=VAL A$: IF L<1 THEN LET L=1
849 RETURN
850 IF CODE A$<49 OR CODE A$>57 THEN
    INPUT "INVALID: TRY AGAIN ";A$: G
    OTO gt
852 GOTO gt+3
870 CLS : PRINT ''''"No. OF ";C$;" ";
    B$;" AXIS?"''''"'ENTER' WILL SET T
    O ";ds: RETURN
900 CLS : PRINT AT 0,3;"PRINT GRAPH P
    APER"''"ALTER THE DEFAULT SETTING
    S?"''''"'ENTER' = NO / 'ANY KEY' =
    YES"''"DEFAULT=8*8 GRID "''"SUBDI
    VISIONS=10": RETURN
1020 RESTORE : FOR a=1 TO 48: READ b:
    POKE 65367+a,b: NEXT a: RETURN
1050 STOP
1100 DATA 192,192,192,192,192,192,192,
     192
1110 DATA 0,0,0,0,0,0,255,255
1120 DATA 128,128,128,128,128,128,128,
     255
1130 DATA 192,192,192,192,192,192,192,
     255
1140 DATA 128,128,128,128,128,128,255,
     255
1150 DATA 192,192,192,192,192,192,255,
     255
8000 INPUT A$: PRINT CODE A$: GOTO 800
    0
9999 SAVE d1"GRAPH" LINE 1
```

I've not got any more room this month. Daniel Cannon's sent me a smashing little program for copying SAM MasterDOS sub-sub-sub directories without having to sort manually through all the directories. It wasn't on a disc, though, and it would have helped if it had been. Robert Brady's sent me a disc full of SAM stuff.

Please keep the stuff coming, especialy a few more small items please, and thanks for all your help.

Send contributions to: John Wase, Green Leys Cottage, Bishampton, Pershore, Worcs, WR10 2LX.

MACHINE CODE WITHOUT THE TEARS

Part 3.

By:- Carol Brooksbank.

Let us see how the routine we wrote last month works as a program.

First we load the stream number we want to use into A, and call the ROM routine which opens a channel to the stream held in A. There are numerous streams, but the three which interest us are 1,2 and 3. I explained what they are last month, and that the routine as written will print to the main screen. LD A,3 would make it a printing routine.

Next, we load HL with the address of the first message byte. At the label PR_LOOP, the byte at the address in HL is loaded into A and CP used to see whether it is 255 - the byte we use as a message end marker. If it is 255, CP will set the zero flag. RET Z tests the zero flag, and exits to BASIC if it is set because that means the printing is finished. If not, it carries on to the next instruction. RET does not have to be the last byte of the listing - it can be in a loop like this - but it must be there somewhere.

We need to keep the address in HL in order to find the next message byte, so we PUSH HL before RST 16, in case HL gets corrupted. RST 16 calls the ROM routine which sends the character for the code byte in A to the chosen stream, and the first character is printed.

After the return from RST 16 we POP HL to retrieve the address of the character just printed, INC HL to go to the next one, and jump back to PR_LOOP for another byte. The routine goes round and round this loop until it picks up the byte after the message, 255.

The message can be anything, so if you are using an assembler put your own message after DEFM. It can be any length, because the program is not restricted to a particular number of loops. As long as the last byte is 255 it will stop when it finds it. The ASCII printable character codes run from 32-127, so 255 cannot be mistaken for a letter.

I have included a code poker below, in case any of you are still trying to work without an assembler. Line 150 is different for Sam and Spectrum, so make sure you enter the right version.

```
 10 REM Spectrum program
 20 CLEAR 49999: LET firstbyte=50000,l
    astbyte=50035
 30 LET q=130
 40 FOR N=firstbyte TO lastbyte STEP 6
 50 LET check=0
 60 FOR B=0 TO 5
 70 READ A
 80 POKE (n+b),A
 90 LET check=check+a
100 NEXT B
110 READ A
120 IF check <>A THEN PRINT "ERROR IN
    LINE ";Q: STOP
130 LET Q=Q+10
140 NEXT N
150 DATA 62,2,205,1,22,33,325
160 DATA 98,195,126,254,255,200,1128
170 DATA 229,215,225,35,24,246,974
180 DATA 84,104,105,115,32,105,545
190 DATA 115,32,97,32,109,101,486
200 DATA 115,115,97,103,101,255,786
210 SAVE "printext" CODE 50000,36
```

The listing above is for the Spectrum. Sam users substitute:-

```
150 DATA 62,2,205,18,1,33,321
```

The program sends the message to the screen when you load the code to 50000 and call it by:- LET A=USR 50000

Now POKE 50001,3 and call it again,

and the message will go to the printer. If your printer has a buffer which is not printed out till it is full, you may need to enter LPRINT after calling the routine, to get it on the paper. Normally, in a printing routine, we would change DEFB 255 to DEFB 13,255. 13 (the Epson printer code for newline) always empties the printer buffer.

POKE 50001,1 will print to the bottom of the screen, but you need to use:-

```
LET A=USR 50000: PAUSE 0
```

or the 0.OK message will rub out your text before you have time to see it.

These POKEs are, of course, changing the number loaded into A which selects the stream to be used. You can see from the listings that this number is the second in the program. The first byte, at 50000, is 62, the object code for Load A with a number.

This is a useful routine which you will probably use frequently, as a subroutine in your own programs. Sam and Spectrum versions are slightly different because their addresses for the channel-to-stream routine are different.

Now we start writing a string sorting routine. It is quite long, so it will take a month or two to complete. You will only meet a couple of new instructions, but I want you to look at the program structure and try to understand as you type it in how the commands fit together to make a working program.

The routine sorts a file of strings of any length, provided three conditions are met: the strings must be poked into memory starting at 28156; each string must be terminated by CHR$ 129; the whole file must be terminated by CHR$ 255.

The routine can handle a file of up to 629 strings of any length. You have over 35K of memory available for them, so this routine, together with one I shall give you later for printing the strings, can form the basis of a very simple filing program. I used this program for years to produce and print an index for my record collection an.

First, here is the BASIC for poking your file into memory.

```
 10 CLEAR 26615
 20 LET N=28156
 30 INPUT "TEXT";A$
 40 IF A$="\" THEN POKE N,255: PRINT N
    :GOTO 130
 50 IF A$="*" THEN POKE N,13:LET N=N+1
    :POKE N,13:LET N=N+1:POKE N,129:LE
    T N=N+1:GOTO 30
 60 FOR B=1 TO LEN A$
 70 POKE N,CODE A$(B)
 80 LET N=N+1
 90 NEXT B
100 POKE N,13
110 LET N=N+1
120 GOTO 30
130 SAVE d1 "FILE" CODE 28156,N-28155
```

(Sam users omit d1 from line 130)

RUN this, and at each "TEXT" INPUT, enter the text for one line of a file record. At the end of each record, including the final one, enter "*" by itself in response to the next prompt. After the final entry, enter "\". The end of file marker, 255, will be poked into the next address, and its address will be printed on screen. Make a note of it, because to add to the file later, you must change the value of N in line 20 to that address. If you need to use "*" or "\" in your file, choose some other signs and alter the BASIC.

All the text entered between "*"s will be treated as one string when the strings are sorted into ASCII order. So you must start with PAIGE, Elaine - not ELAINE PAIGE - if you want the entries in surname order.

Now for the machine code. It sorts very quickly because it does not move the strings. It is called a tag sort. It makes a list of the start addresses of the file entries, in the order in which they need to be printed to give a sorted file. Type the blocks of instructions in bold type into your

assembler in the order they appear in the articles.

The code, with its printing routine, will reside between 26616 and the start of the file, so ORG 26616.

```
        ORG 26616
LSF     DEFW
CS      DEFW
NS      DEFW
FWS     DEFW
WORKSP  DEFS 1260
EOF     EQU 255
EOS     EQU 129
FILE    EQU 28156
```

I said that addresses and values can be stored in the registers and on the stack, but if you have some values which are constantly being updated as the program proceeds, it is better to keep them in the program itself as program variables. So we begin with storage space for four addresses. The pseudo-opcode DEFW instructs the assembler to set aside two bytes for each address.

Next, the pseudo-opcode DEFS, tells the assembler to reserve 1260 bytes for the workspace in which the list of addresses will be built up. Each address needs 2 bytes, so the program can list 630 addresses. One must be the address of the end of file marker, so there can be 629 records in the file.

Then come three labels allocated values by EQU. These enable us to use the label instead of the number in the listing when we need to refer to one of them. We could write the number out each time, but this makes the listing easier to follow. Whenever the assembler meets one of the labels, it will interpret it as the number assigned to it.

How does the program work? It begins by clearing the workspace so that there is no danger of any leftover addresses from a previous sort corrupting this one. Then it makes a series of passes through the file. At the start of each pass, the address of the first string not already listed is called the Lowest So Far, and the second unlisted string the Current String. Next String is always the one immediately after CS. During the pass, each CS is checked against LSF. If CS is lower than LSF it becomes LSF, if not we move on and the NS becomes CS. If that is already listed we move on again, if not it is checked against LSF. When each new CS is fetched, the one following it becomes NS. When the EOF marker is reached, LSF is the lowest unlisted one found in the file so its address is put in the first free workspace. When the program cannot find an unlisted string to use as LSF for the start of a pass, the whole file has been sorted, so the address of EOF is stored in the workspace and the program returns to BASIC.

```
NEXTSTR LD A,(HL)
        CP EOS
        RET Z
        INC HL
        JR NEXTSTR
```

NEXTSTR is a short subroutine called with the start address of a string in HL. It returns with HL holding the address of the string's end marker. It keeps doing INC HL and checking (HL) until it finds EOS. Every subroutine, like every machine code program, must have a RET to terminate it - in this case it is RET Z, which you met last month. When a subroutine meets a RET instruction, it will return to the instruction after the one which called the subroutine. Only the main program's final RET goes back to BASIC.

```
START   LD BC,1259
        LD HL,WORKSP
        LD (HL),0
        LD DE,WORKSP+1
        LDIR
```

START is the beginning of the main routine, the address from which the machine code will be called, by:-

```
LET A=USR 27891
```

A machine code routine does not have to be called from the first byte. We

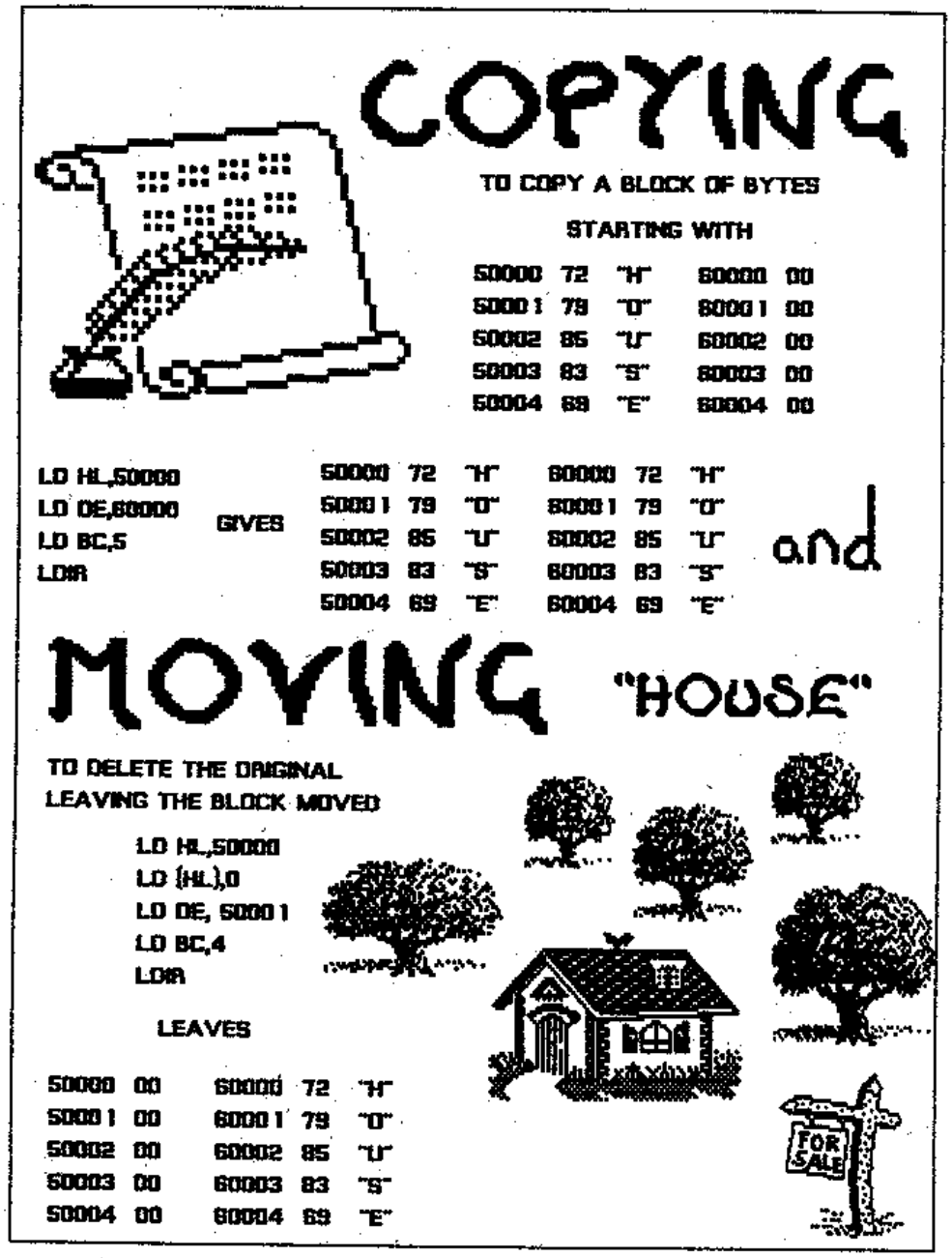

Fig.1

have over 1000 bytes between the beginning of the code block and START - the variables, the workspace, and the subroutine.

The first operation clears the workspace, and we meet the first new instruction - LDIR LoaD, Increment and Repeat - which copies the contents of one block of memory to another. You put the address of the start of the block to be copied in HL, the start address of the place to which you want to copy it in DE (DEstination) and the number of bytes to be copied in BC (Byte Counter). LDIR copies the byte at the address held in HL to the address held in DE, then does INC HL, INC DE and DEC BC. The process is repeated until BC is 0. The instruction LDDR LoaD Decrement and Repeat does the same thing backwards - you load HL and DE with the last addresses in the blocks involved. After the byte has been copied from (HL) to (DE), LDDR does DEC HL, DEC DE and DEC BC. We use LDIR here because we know the start addresses.

LDIR is used in a cunning way here, to poke the same byte - 0 in this case - into a block of addresses. HL holds the start of the block, and LD (HL),0 pokes the first byte. DE holds the second address in the block. LDIR will copy the 0 we poked into the first one into the second, and so on through the block because DE is always one byte ahead of HL. BC starts off with one byte less than the size of the block, because LD (HL),0 poked one byte. Fig. 1 shows how LDIR is used to copy bytes. If you want to move, not copy them, you use LDIR again as we have here to clear the original block.

That is all we have time for this month. Remember to save your source code because we have a lot more to add!

NEV'S HELP PAGE

By:- Nev Young.

Every now and then I get a letter that at first reading I cannot help but think what an obvious question. What kind of a lame brain must this guy be to ask somthing like that. Then a few days later I re-read the letter and manage to remember how I found that point difficult many years ago when I first started programming, so my appologies for even considering the term 'lame brain', after all you are reading FORMAT so you must be wise and sensible people.

The following is just such a question. "The manual has rather inadequate coverage of the 'IF' command as I have noticed undocumented uses by yourself and others. The manual discusses the syntax:-

IF a (condition) b THEN (action)

and cases where the THEN may be omitted, and also the command:

IF ..... THEN .... ELSE

all of which make sense. However, expressions such as:

IF variable (condition) x THEN :

- THEN what?

IF Variable :

- Variable is what? Do what?

seem to be meaningless. Some explanation is called for if only for beginners such as myself." So for Derek and anybody else that has had problems with the IF command and all of its variants - here goes...

On the spectrum the only type of IF available is:

IF <expression> THEN command(s)

When this point is reached in the program the computer first has to evaluate (work out) the <expression>. This has to be a BOOLEAN expression. Don't run away, BOOLEAN is a type of binary arithmetic named after the person who first used it, (Mr Boole). As you should know in binary there are only two numbers 0 and 1. In BOOLEAN arithmetic there are only two "states" TRUE and FALSE.

So the <expression has to be either TRUE or FALSE, anything else is nonsense. It should be easy to see then that IF the <expression> is TRUE THEN do the command or commands that follow. If the <expression> is FALSE THEN don't. On the Spectrum everything after the THEN is ignored upto the next command that starts with a new line number. For example:

```
10 IF 1 > 2 THEN PRINT "All arithmet
   ic is nonsense" : BEEP 2,2 : STOP

20 IF 2 > 1 THEN PRINT "All arithmet
   ic makes sense" : BEEP 1,1 : STOP
```

As the expression "1 is greater than 2" is FALSE the commands after THEN in line 10 will not be executed and as the expression "2 is greater than 1" is TRUE then all the commands after the THEN in line 20 will be executed.

The SAM Coupé has the same format, and a few more, but the main thing to note is that everythng that follows the THEN is either executed or ignored. (For any body thinking about using other computer languages then take note that this is not true for all languages).

Now for some brain work. Computers, as you all know, are realy very stupid. They do not know truth or falsehood. Computers can not even recognises the letters of the

alphabet. Many of you will already know that all letters are stored as numeric codes (ASCII codes) where every letter or symbol is given a unique number. eg "A" is represented by the number 65. In the same way TRUE and FALSE are also given numeric values. On both the Sam and the Spectrum FALSE is represented by the number 0 (zero) and TRUE by any number that is not zero (normally 1).

So we can safely say that TRUE is NOT FALSE and FALSE is NOT TRUE. There is no inbetween. A few examples:

```
1 > 2 is FALSE and is held as 0
1 < 2 is TRUE and is held as 1
"abc" < "def" is TRUE and is held as 1
```

You can prove this by typing in commands like:

```
PRINT (1>2)
PRINT ("abc" < "def")
etc.
```

Now we can see how one of the tricks that programmers use works. As any number that is not zero will be taken as TRUE. Try this:-

```
10 FOR N=-10 TO 10
20 PRINT N,
30 IF N THEN PRINT "TRUE"
40 IF NOT N THEN PRINT "FALSE"
50 NEXT N
```

We know than N is a number but the computer is stupid and can not tell the difference between a number and a BOOLEAN and so gets fooled.

Now for Sam users who have more ways of using IF type the following:

```
10 IF 1 > 2 THEN : PRINT "SOMETHING
   IS WRONG": ELSE : PRINT "EVERYTHI
   NG IS RIGHT"
```

Now as a direct command type LIST FORMAT 1 and press enter and you will see the line is redisplayed as:-

```
10 IF 1 > 2 THEN
    PRINT "SOMETHING IS WRONG"
   ELSE
    PRINT "EVERYTHING IS RIGHT"
```

The colons have disappeared and instead the listing has been given some structure. Now type LIST FORMAT 0 and enter. Then remove the colons after the THEN and ELSE. Now do LIST FORMAT 1 and you will get:

```
10 IF 1 > 2 THEN PRINT "SOMETHING IS W
RONG" ELSE PRINT "EVERYTHING IS RIGHT"
```

With this form of the IF if the expression is TRUE then everything after THEN and before ELSE is executed and everything after ELSE the end of the line is ignored. If the expression is FALSE then every thing between THEN and ELSE is ignored and everything from ELSE to the end of the line is executed. The reason for the extra : is so than when you use the formatted listing it is easier to see which parts belong to THEN and which to ELSE as I hope the above example shows. For reasons of printing clarity listing in FORMAT are always printed with LIST FORMAT 0 so the extra colons can be seen.

With all the forms shown so far there is a problem that everything has to be on one line, and as a result that line can get very long and unmanageable. So overcome this and to add more confusion the Sam has yet another version of IF. This is the one that does not have the THEN after the expression. eg

```
10 IF 1 < 2
20 PRINT "THATS FINE"
30 ELSE
40 PRINT "THATS WRONG"
50 ENDIF
```

What happens now can be seen if you use LIST FORMAT 1 once more. If the expression is TRUE then everything between the expression and the ELSE is executed. If it is FALSE then everything between the ELSE and ENDIF is executed. The difference is that the IF command now spans many lines. I would hope that you can see that the ELSE part need not be present (ie lines 40 & 50) but you do need to have an ENDIF somewhere to stop the IF.

The next problem you will have is

understanding the relationships between variables in expressions. You know what I mean the <, >, <>, =, >=, <= These are called comparative operators, big name small job. I hope you know thay are read as "is less than", "is greater than", "is not equal to", "is equal to", "is greater or equal to", "is less or equal to" (you know now!). These should not be confused with the BOOLEAN operators AND, OR and NOT. Also be aware that as in ordinary arithmetic anything in brackets is worked out first.

When you compare two things with a comparative operator the result is, as we have seen, a BOOLEAN. You can then use multiple BOOLEANs by using the BOOLEAN operators. eg

```
IF (1 < 2) AND (2 < 3) THEN....
```

This works out as IF expresion 1 is TRUE AND expresion 2 is TRUE THEN .... I would hope the result of using OR is obvious. The one that catches people out is NOT.

```
IF NOT (1 > 2) THEN
```

All that NOT does is make TRUE FALSE and FALSE TRUE. So IF NOT (1 > 2) THEN is identical to IF (1 < 2) THEN.

So why have it? It is there to make the program read more like English. Other things that are equvilent are:

```
( a <> b )    NOT (a = b)
( a >= b )    NOT (a < b)
( a <= b )    NOT (a > b)
```

I do know of languages where the three operators on the left do not exist and you have to use those on the right but then you can end up with hard to read conditions like:

```
IF NOT (A = B) AND
   NOT (A > C) AND
   NOT (A < D) THEN
```

Which in basic would be

```
IF (A <> B) AND
   (A <= C) AND
   (A >= D) THEN
```

Which is easier to read and understand. (I hope).

Finally another trick that is used quite a lot is the reverse of the trick mentioned earlier. Here instead of tricking the computer into using a number as a BOOLEAN it can be tricked into using a BOOLEAN as a number.

For example:

```
10 LET X$ = INKEY$
20 PRINT AT 0,0;(X$>"a")+(X$>"o")
30 GOTO 10
```

I won't tell you how this works but I hope that if you can't see it then you will type it in and experiment. When run a number will be printed at the top left of the screen pressing various keys will have different effects.

I'm sorry I've got carried away and only answered one letter this month I will try and do better next month. Meanwhile send your problems to:

Nev Young, Format Help Line,
70 Rainhall Road, Barnoldswick,
Colne, Lancs, BB8 6AB.

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SAM's PUBLIC

MONTHLY LOOK AT PUBLIC DOMAIN SOFTWARE FOR THE SAM COUPE

By:- Brent Stevens.

First, an explanation about SAMsational Software issue 2. The release of the catalogue was delayed for around a month for various reasons, and I had hoped to let you know about this last month but my article arrived too late for FORMAT's deadlines. We have had our work cut out with orders flying through the letterbox which are then going out to the PD producers just as quickly as they can.

Issue 3 will be due in time for Christmas (late November/early December) and the same launch delay problems should not occur, as we now have the experience in dealing with them.

There is now an indication on the quality of discs listed, ranging from VERY POOR to SCPDSA AWARD WINNERS. Don't be put off if a disc hasn't got an award. Many discs with good or fair are still worth buying. Because of the new system, some discs that were previously given SCPDSA AWARDS may be marked as good, but get them all the same!

As many of you may notice from SAMsational Software, there are many more discs available (over 100), in fact, there are more than double the discs there were previously. This means that the software now caters for a wider range of needs, and the same increase will happen with issue 3, where some educational software is in the pipeline.

Look out for the new prices. Fastline has dropped most disc prices from £2.20 to £1.50, and the Enceladus discs have been reduced from £3.99 to £2.50. There's no excuse not to get hold of these very good discs now. A few new software producers have made an appearance, as detailed below, and the occasional disc has had a price increase to beat the effects of recession (and £400 overdraft). Overseas postage and packaging charges are also reduced. Now the post office has put stamp prices up yet again, I wonder if everyone can keep up with the low prices.

One last change for this month. Quality indications, prices and order codes are listed separately at the end of the article, as in SAMsational Software. This prevents small mentions getting skipped over, and is generally easier to use. Thanks to a Mr P.Sara from Bristol for that idea (Hi Phil!).

Now onto the reviews:-

Arcadia is a newcomer to the SAM PD scene. It looks very good for it's first issue. There is a reasonable editorial section, very good reviews, and 2 games. Columns is a Tetris clone where there are blocks falling from the top of the screen. The only difference is that each large block consists of 3 small blocks joined together, and have to land to form a column of 3 or more of the same style of blocks. Sometimes a chain reaction happens, where 1 column will make others appear beside it and so on. After a few pratice games, you will be playing this for hours. The second game is Crossword Puzzle. Answer the simple clues of the crossword given. All the programs and presentation have a pleasant finished-off appearance, and it can be seen that a lot of hard work has gone into this disc. On it's first issue, it is already proving to be quite popular, and I can see plenty of potential for future issues.

Edwin Blink has been hard at work now that his brilliant assembler - COMET is almost finished. From this Dutch software genius comes 2 more

sample demo discs, each holding the best quality samples available to date. BLINK DISK 3 (D-EURO001) had the kylie samples on, BLINK DISK 2 has a second 512K Kim Wilde demo (the first was on the SCPDSA demo disc) and the 512K version of Gary Moore's THUNDER. For those Coupérians who haven't upgraded to 512K (and you should do soon, because you are missing out on new software), BLINK DISK 1 has a third Kim Wilde demo (256K), and Def Leppard's Animal. This disc doesn't have a blank screen when playing, and the visual FX are fantastic. Worth getting to impress Amiga owning friends.

Integrated Logic are back doing PD software. Their Amiga IFF screen converter (not PD) has been producing some very good results, and now fans of Nightbreed can look at all the characters from the film as digitised screens. The quality is very good, and the disc is nicely presented. Note - this disc requires MasterDOS. They have also converted a popular PD disc with various screens, but that wont be mentioned here.

FRED issues 11, 12, 13 and 14 are all out now (shows how long I have been away). Issue 11 is a double disc issue, hence is twice as expensive as normal. There's some great stuff on this disc. The PURGE game demo features incredible intro music, which I thought was sampled sound being overlayed onto different tracks. This demo is also playable as a vertically scrolling shoot-em-up, with different weapon types. Look out for plenty of smaller demos and programs. Encounters makes another appearance with Z.Green (are you getting a bit bored with him Bob, because methinks there is more of him to come!), yet another part of the machine code tutorial, and the odd game. This is a big issue and is worth every penny.

FRED 12 has some good samples on it. Ever heard the Megablast music on the ST or Amiga version of Xenon 2 by Bomb the Bass? Well, there's a Coupé version (of the music, not the game) being a sample of the ST version, and is probably just as good. There is also a plethora of demos (isn't there always?). Great presentation.

FRED 13 features yet another sample. It seems like a new feature on FRED discs. Gauntlet players will recognise the tune taken from the ST. The Gods demo features a well animated sprite that can be controlled to run, jump, fight and turn. This type of thing is ideal in learning how to do such things in your own programs. There is a QL to SAM BASIC file converter. If anyone can test this out then let me know how you get on. There's quite a few simple utilities for this disc, and another part of the machine code tutorial.

FRED 14 gets a mention next month, because my copy was pinched from the last All Format's show in Birmingham (sorry Colin).

Now for a diary program. Dan Brice has produced an easy to use diary which differs from most PD diary-like programs in that it comes with printed documentation, and text files are saved as screens. The text editor is fast and responsive, and a password facility is incorporated to prevent anyone looking through your secrets!

Dave Tonks has been busy on his Amiga and ST converting some of the more popular animated demos from Amiga and ST PD libraries. They are distributed courtesy of the great disc mag SAM Supplement, which gets a review next month.

The first of his great conversions requires 1.2Mb, and you will also need MasterDOS. This demo is the AT-AT Walket demo. If you don't have a clue what this is about, then let me put you in the picture. Remember a brilliant film by George Lucas called Star Wars? Well, the AT-AT Walkets come from the sequel - The Empire Strikes Back. They are giant mechanical battle machines; looking a bit like camels; manned by the Empire, and are on their way to crush the Rebel Alliance.

The next Dave Tonks Demo features 3 conversions. Frog on a swing is the first, which features a cute frog on a swing (predictable or what!), but the demo features smooth animation with inertia effects, taken from the Amiga. Stealth Flypast features filled in wireframe graphics of a Stealth fighter flying quite quickly over a landscape. This was also convered from the Amiga. Now an Atari ST conversion - Newton's cradle - Great artwork animation of the kinetic energy device that also features a realistic inertia effect. All these demos are in colour, and are probably some of the best around (hence the reason that they are award winners).

DATON, as Dave is known to some Coupé users has produced quite a large range of other demos, all of which are very good quality. You can find more by writing to the Supplement address, or getting next month's FORMAT!

That's about all for this month. Here's the order codes and prices for the items mentioned this month:-

ORDER	DESCRIPTION	PRICE	MEM.	RATING
D-ARCA001	Columns game	£2.00	256K	AWARD
U-DABR001	Notable diary	£2.00	256K	GOOD
D-EURO002	K.Wilde 2/Gary Moore	£1.25	512K	GOOD
D-EURO003	KW3/Def Leppard Animal	£1.25	DUAL	AWARD
D-INTL001	Nightbreed slideshow	£3.00	256K	GOOD
M-FRED011	Demos & samples	£1.70	256K	AWARD
M-FRED012	more demos & samples	£1.70	256K	AWARD
M-FRED013	Yet more demos & samples	£1.70	256K	AWARD
M-FRED014	See next month	£1.70	256K	
D-SUPP002	Walker Demo	£2.00	1.2Mb	AWARD
D-SUPP003	Frog/N.Cradle demos	£3.99	512K	AWARD

Send cheques, IMO's or PO's, all payable to SCPDSA, to the following address:- SCPDSA.
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Kingston Upon Thames,
Surrey, KT2 7QT.

Anyone producing PD software for the SAM Coupé should also drop me a line at the above address (send samples if you can) and I will try to give you a mention.

LOGO-MAKER

Text By:- Carol Brooksbank. Program By:- Tony Wood.

Tony Wood's Spectrum/PLUS D suite of programs provide a quick and easy way of printing logos for your headed notepaper, compliment slips and so on, and of printing decorative borders.

But first, you must produce your logo design. You can use an art package, BASIC or what you will to produce a screen containing your motif. I imagine you would like to try the routines out without reaching for an art package to design something first, so I have written a short BASIC program, Listing 1. It produces one segment of the traditional Greek key border pattern in the top left corner of the screen, and then saves the SCREEN$ under the name "BORDER".

LISTING 1.

```
 10 CLS
 20 PLOT 0,175
 30 DRAW 0,-40
 40 DRAW 40,0
 50 DRAW 0,32
 60 DRAW -24,0
 70 DRAW 0,-16
 80 DRAW 8,0
 90 DRAW 0,8
100 DRAW 8,0
110 DRAW 0,-16
120 DRAW -24,0
130 DRAW 0,32
140 DRAW 40,0
150 SAVE d1 "BORDER"SCREEN$
```

If you are going to use a motif in a repeating border, it is helpful to make the design fit exactly into the Spectrum character squares horizontally so that there is no gap between the repeats. If you are using a graphics package, most have a grid overlay which helps, or if you are using BASIC, make sure that the overall width of the motif is a multiple of 8 pixels. Listing 1's motif is 48 pixels wide.

Now to turn to Tony's programs. Listing 2 is the code poker which produces the "LOGO_C" code block. Type in and RUN this program. If all is well, the code will be saved to the disc. If you have made a mistake in entering the DATA, the program will stop with an error message giving the line number in which the mistake occurred. Put it right, re-save and RUN the program again.

LISTING 2.

```
  1 REM ** CODE POKER * *
  5 CLEAR 65007: LET FIRST=65008: LET
    LAST=65203
 10 LET Q=130
 20 FOR N=FIRST TO LAST STEP 7
 30 LET CHECK=0
 40 FOR B=0 TO 6
 50 READ A
 60 POKE (N+B),A
 70 LET CHECK=CHECK+A
 80 NEXT B
 90 READ A
100 IF CHECK<>A THEN PRINT "ERROR IN
    LINE ";Q: STOP
110 LET Q=Q+10
120 NEXT N
125 SAVE D1"LOGO_C" CODE 65008,196
130 DATA 42,236,253,34,238,253,237,12
    93
140 DATA 75,232,253,197,237,75,234,13
    03
150 DATA 253,205,157,254,62,106,18,10
    55
160 DATA 12,237,67,234,253,237,91,113
    1
170 DATA 236,253,6,8,126,18,36,683
180 DATA 19,16,250,237,83,236,253,109
    4
190 DATA 193,13,197,12,65,16,218,714
200 DATA 58,234,253,237,75,232,253,13
    42
210 DATA 89,145,237,75,234,253,79,111
    2
220 DATA 4,237,67,234,253,193,75,1063
230 DATA 16,194,205,95,254,205,63,103
    2
```

```
240 DATA 254,201,42,238,253,237,75,13
    00
250 DATA 232,253,197,65,197,62,8,1014
260 DATA 6,8,203,30,203,17,16,483
270 DATA 250,113,35,61,32,243,193,927
280 DATA 16,237,193,16,232,201,42,937
290 DATA 238,253,237,75,232,253,197,1
    485
300 DATA 65,197,30,128,229,14,0,663
310 DATA 6,1,123,166,254,0,40,590
320 DATA 3,121,128,79,203,32,35,601
330 DATA 48,242,225,197,203,59,48,102
    2
340 DATA 231,17,7,0,167,25,6,453
350 DATA 8,209,115,43,16,251,35,677
360 DATA 17,8,0,167,25,193,16,426
370 DATA 207,193,16,202,201,120,230,1
    169
380 DATA 24,103,203,244,15,15,15,619
390 DATA 246,88,87,120,230,7,15,793
400 DATA 15,15,129,111,95,26,201,592
```

Once the coue block is saved, type in listing 3, LOGOMAKER itself. This program, with the machine code, converts your logo into a DATA array, gives you a sample print, together with information you need to use the array in other programs, and saves the array to disc.

LISTING 3.

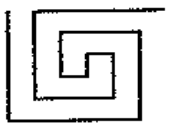
```
  1 REM ** LOGOMAKER **
 10 CLEAR 39999
 20 LOAD D1"LOGO_C"CODE
 30 INPUT "SCREEN FILE NAME?", LINE N
    $
 40 INPUT "TOP LEFT CORNER ROW,COL?",
    Y,X
 50 INPUT "ENTER ROWS/COLS ?",R,C
 60 REM LOAD DATA INTO M.CODE ROUTINE
 70 LET ADDR=40000
 80 LET H=INT (ADDR/256): LET L=ADDR-
    256*H
 90 POKE 65000,C: POKE 65001,R: POKE
    65002,X: POKE 65003,Y: POKE 65004
    ,L: POKE 65005,H
100 PRINT AT 10,1;"INSERT DISC WITH S
    CREEN FILE"'''      PRESS ANY KEY
            ": PAUSE 0
110 LOAD D1;N$SCREEN$
120 RANDOMIZE USR 65008
130 LET COUNT=C*8: LET HC=INT (COUNT/
    256): LET LC=COUNT-256*HC
140 PRINT #1;"CREATING DATA ARRAY": D
    IM Q$(R,COUNT)
150 FOR L=1 TO R
160 FOR F=1 TO COUNT
170 LET A=PEEK ADDR: LET Q$(L,F)=CHR$
     a
180 LET ADDR=ADDR+1
190 NEXT F: NEXT L
200 BORDER 1: CLS : PRINT #1;"PRINTIN
    G LOGO"
210 REM First. Stop DOS altering prin
    ting.
220 POKE @6,1
230 LPRINT CHR$ 27;CHR$ 51+CHR$ 1: RE
    M Set min Line Feeds.
240 REM Loop for number of lines.
250 FOR I=1 TO R
260 LPRINT CHR$ 27;CHR$ 75;CHR$ LC;CH
    R$ HC;Q$(I);CHR$ 27;CHR$ 74;CHR$
    21
270 NEXT I
280 LPRINT CHR$ 27;CHR$ 51+CHR$ 36: R
    EM Set Normal Line Feeds.
290 POKE @6,0
300 BORDER 7: CLS : PRINT #1;"SAVE LO
    GO DATA ARRAY Y/N"
310 LET I$=INKEY$: IF I$="" THEN  GOT
    O 310
320 IF I$="N" OR I$="n" THEN  STOP
330 INPUT "FILE NAME ?";N$
340 LPRINT N$;" =DIM Q$(";R;",";C;"*8
    )": LPRINT "HC=";HC;"  LC=";LC
350 SAVE d1;N$  DATA Q$()
360 STOP
```

In line 30, you are prompted for the SCREEN$ filename - "BORDER" for our Greek key motif SCREEN$. Line 40 asks for the row and column numbers of the top left corner of the motif. Our motif is in the top left corner of the screen, so these are 0,0. Line 50 requires the size, in rows and columns. The Greek key is 6 rows x 6 columns. Line 60 starts a routine that POKEs these values into the machine code variables, loads the screen, and calls the machine code routine to convert the motif into a string of bytes stored from address 40000 onwards.

Line 130 calculates the width of the motif in pixels, and converts this to the 2-byte form. HC is the MSB of the width, and LC the LSB. These numbers will be printed with the motif on the printout produced by the program, because they are required in the programs which use the data array set

up in lines 140 to 190. The dimensions of the array are the number of screen rows in the motif and the number of pixels in its width, and the motif bytes are loaded into the array from the workspace at 40000.

Line 200 begins the printing of the sample logo. After the motif has been printed the array dimensions and bit-image data are also printed and then the DATA array is saved to the disc. Fig.1 shows the printed output of LOGOMAKER using our Greek border.



```
B1 =DIM Q$(6,6*8)
HC=0   LC=48
```

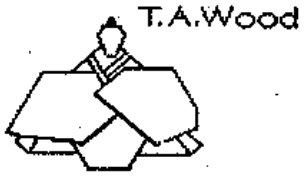
Fig.1.

Having converted a logo to a DATA array and saved it to disc, what use is it? Tony has sent us two demo programs. Listing 4 is the program which produces Tony's invoices, Fig.2. For this he has used the DATA array for his own logo, "TAWLOGO", but if you wanted to use our Greek key motif, you would first change the array dimensions in Line 30 to (6,6*8). It doesn't matter what letter you give the array, Q$ or Y$, but the dimensions must be the ones from the LOGOMAKER printout. In line 50 you set the bit image data copied from the printout. In line 150, the number of times the loop repeats must match the first figure in the DATA array dimensions. Tony has used plenty of REM statements to show where the program is sending printer codes and their effect, and you can see how he uses the logo printing along with his address and other information like date and invoice number.

LISTING 4.

```
 10 LET INVNUM=27008
 20 LET D$="17/06/91"
 30 DIM Y$(10,15*8): REM Logo is 10 l
    ines high by 15 characters wide
 40 LOAD D1"TAWLOGO" DATA Y$(): REM L
    oad logo into array.
 50 LET M$=CHR$ 27+CHR$ 75+CHR$ 120+C
    HR$ 0: REM Esc "K", 120 bits.
 60 LET E$=CHR$ 27+CHR$ 27+CHR$ 69: R
    EM Emphasized Mode On. Note doubl
    e CHR$ 27 because we only use it
    with POKE @6 = 0
 70 LET F$=CHR$ 27+CHR$ 27+CHR$ 70: R
    EM Emphasized Mode Off. Note doub
    le CHR$ 27 as above.
 80 LET L$=CHR$ 27+CHR$ 74: REM Code
    for single n/216 Line Feed, To be
     followed by value for n.
 90 LET N$=CHR$ 27+CHR$ 51: REM Code
    to set n/216 Line Feeds (SEE EDIT
    OR'S NOTES).
100 REM START OF PRINT ROUTINE.
110 LPRINT E$;"              YOUR ADDR
    ESS AND TELEPHONE NUMBER COULD GO
     HERE";F$
112 LPRINT
120 POKE @6,1
140 LPRINT N$;CHR$ 1: REM Set minimum
     line spacing.
150 FOR I=1 TO 10: REM The number of
    lines in the logo.
160 FOR J=1 TO 2: REM The number of t
    imes to print each line of the lo
    go(the more the darker, good when
     your ribbon needs reinking).
170 LPRINT M$;Y$(I)
180 NEXT J
190 IF I=3 THEN  POKE @6,0: LPRINT TA
    B 60;E$;"DATE: ";F$;D$: GOTO 220
200 IF I=5 THEN  POKE @6,0: LPRINT TA
    B 60;E$;"INVOICE: ";F$;INVNUM: GO
    TO 220
210 IF I=7 THEN  POKE @6,0: LPRINT TA
    B 60;E$;"TAXPOINT: ";F$;D$: GOTO
    220
220 POKE @6,1
230 LPRINT L$;CHR$ 22; REM Throw 22/2
```

YOUR ADDRESS AND TELEPHONE NUMBER COULD GO HERE



DATE: 17/06/91
INVOICE: 27008
TAXPOINT: 17/06/91

Fig.2. ALL DONE.
YOU CAN NOW ADD LINES TO PRINT THE REST OF THE INVOICE.

```
    16" May need changing on your pri
    nter.
 240 NEXT I
 250 LPRINT N$;CHR$ 36
 260 POKE @6,0
 270 LPRINT "ALL DONE."'"YOU CAN NOW A
     DD LINES TO PRINT THE REST OF THE
      INVOICE."
```

Listing 5 is the program which prints decorative borders, producing Fig.3.

LISTING 5.

```
 10 INPUT "Number of repeats?";R
 20 DIM L$(6,6*8): LOAD D1"BORDER" DA
    TA L$()
 30 DIM R$(6,6*8): LOAD D1"BORDER" DA
    TA R$()
 40  REM Insert the array dimensions
    from LOGOMAKER output
 50 LET HC=0: LET LC=48
 60 POKE @6,1
 70 LPRINT CHR$ 27;CHR$ 51;CHR$ 1: RE
    M SET MIN LINE SPACING
 80 LET S$=CHR$ 27+CHR$ 75+CHR$ LC+CH
    R$ HC
 90 FOR I=1 TO 6
100 FOR J=1 TO 2: REM DARKNESS.
110 FOR L=1 TO R
120 LPRINT S$;L$(I);S$;R$(I);
130 NEXT L
140 LPRINT
150 NEXT J
160 LPRINT CHR$ 27;CHR$ 74;CHR$ 21: R
    EM DO LINE FEED.
170 NEXT I
180 LPRINT CHR$ 27;CHR$ 51;CHR$ 36: R
    EM RESET LINE SPACING
190 POKE @6,0
```

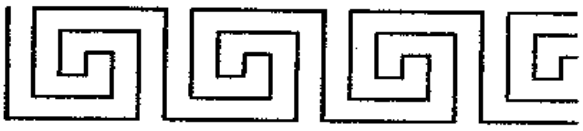


Fig.3.

In Lines 20 and 30, Tony has provided for the border to be printed using pairs of motifs although in the example above we have loaded the same into both L$ and R$.

Fig.4 shows two different leaf motifs, one a mirror image of the other, as produced in LOGOMAKER while fig.5 shows the border produced when these are printed together. This provision makes the border printing much more versatile and there is no reason to stop at two motifs.

```
LEAFL =DIM Q$(9,8*8)
HC=0   LC=64
```

```
LEAFR =DIM Q$(9,8*8)
HC=0   LC=64
```

Fig.4.

Fig.5.

The "number of repeats" prompt in line 10 is for the number of times the pair is to be repeated, 2 in the case of Fig.3. Array dimensions are again taken from the LOGOMAKER printout information, as are the bit image data in line 50. The I loop in line 90 must match the first figure - the number of screen rows - in the DATA array.

I am quite sure that you ingenious Format readers will be adapting Tony's listings to print more than two motifs in a border, to print vertical borders as well as horizontal, and so on. His machine code can be used to convert anything up to a whole screen into a data array which can later be loaded into a BASIC program for printing without the need for loading SCREEN$ or machine code screen dump routines. Many thanks, Tony, for a clever and very useful set of programs.

EDITOR'S NOTES:-

As LOGOMAKER is such a good idea I have taken the liberty of rewriting the Basic of Tony's LOGOMAKER and the original demo so that they will work with as wide a range of printers as possible. Authors should bear the following points in mind when writing printer routines.

First. Not everyone has an Epson compatible printer so if you can avoid the use of Esc "*" for bit image graphics. In this case Esc "K" has been used instead of Esc "*" 4, as Esc "K" is available on IBM type printers as well.

Second. Most people have their printers set up to do an Auto Linefeed after Carriage Return. This is the default expected by Interface One, PLUS D, BBC and many other computers. However, many have their printer set so that a Linefeed (CHR$ 10) must be sent by the software, this is the default with IBM PC type machines. This causes a problem, not every printer has dip-switches in an easy to reach place. Also not every printer can over-ride the dip-switch by software control.

The simple answer is to set the line spacing to 0/216 inch, so no advance will take place unless you send the special command to feed the paper an exact amount. Again, not every printer will allow 0/216, some will only allow 1/216 (although in many cases this will not produce any actual movement). This is the option I have chosen to use as it allows every Epson and IBM compatible printer I have come across to work. It also allows for over-printing when necessary. In fact, where the printer does actually do a 1/216" line feed this produces a much better result as it tends to fill in the gaps between the dots. The command Esc "J" is then used to send an exact line feed when required. The actual number that follows the Esc "J" needs to be experimented with. On the range of printers I have tried the number ranged from 20 to 24. If you get slight gaps then lower the number, slight squashing and you need to raise the number.

So far I have not found a dot matrix printer that this printing method fails to work on, and I have so far tried seven (including two quite old machines).

Finally, I have had this program running on SAM. Run the main LOGOMAKER program under one of the Spectrum emulators, save a code file starting at 40000 and as long as it needs to be. Rewrite in SAm Basic the loop that fills the array, load your saved code file into a convenient place in memory and run the routine to make a SAM array. From then on use the array in the same way as you would on a Spectrum. I'm sure someone will soon come up with a way of converting Mode 4 screens into arrays, I think it could even be done in Basic.

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THOUGHT SPOT.

By:- Jeremy Cook.

Good day to one and all. Here we are once again with a collection of puzzles of all ages, hopefully for people of all ages. I usually try to give some puzzles that most people should be able to solve and also some harder ones that should take more thought. If I am not succeeding, please let me know.

I thought that I would try an easier(?) prize puzzle this month, with the prize being (all together now...) ONE YEARS FREE SUBSCRIPTION to FORMAT. Perhaps I should call the prize something; "The Cook Award" has been suggested. I would still have to explain what it was each time so I probably won't bother. Besides, nothing else would have quite the same ring to it, would it?

Following these delightful little problems is, you'll be pleased to know, another prize puzzle result. I am beginning to get on top of them, and I shall try and bring you right up to date with them somehow.

PRIZE PUZZLE NO.12 : ROUNDABOUT

What I would like you to do this month is write a program that asks for a number, and then draws on screen a figure with that many sides. So, for example, if 5 is input, then a pentagon is to be drawn. But wait, for that is not all I require. Next your program should request coordinates for the centre of rotation, and the angle in degrees for each rotation. Then the figure should be rotated the given number of degrees clockwise, about the given centre. Note that the old figure should be erased at each rotation.

Since this problem is a bit mathematical in nature, I shall show you how to rotate a single point. First note that computers usually work in radians, which is a different angle measure to degrees. Hence angles need to be converted: radians = PI*degrees/180. Say the coordinates of the point are (x,y), the centre of rotation is (cx,cy) and the angle to rotate is r radians. Then the new x-coordinate is (x-cx)*COS(r)+(y-cy)*SIN(r)+cx, and the new y-coordinate is (y-cy)*COS(r)-(x-cx)*SIN(r)+cy (it may be an idea if you check this, just to make sure). All other details you will have to work out for yourself.

I want your programs to be as neat and short as you can make them, and sent in by 1st December 1991 to:-

Jeremy Cook (Thought Spot)
6, Burgoyne Road,
Sunbury-on-Thames,
Middlesex,
TW16 7PW.

(Note that discs/cassettes will only be returned if an SAE is enclosed).

Beyond this point you will find all sorts of mind mangling muzzles, sorry, puzzles to get your brain out of reverse.

BATH TIME

A bath can be filled by one tap in seven and a half minutes, whilst it takes the other tap six minutes. With the plug out it takes a full bath five minutes to empty. If both taps are on full and the plug is out, will the bath fill up, and if so, how long will it take?

NINETEEN

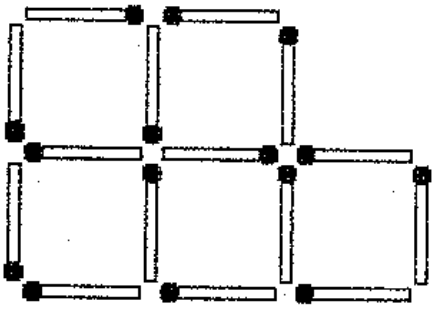
What is the cube root of nineteen? And before you rush to your abaci and come up with 2.6684... let me explain. In this sum the digits have been replaced by letters, thus the word

"nineteen" stands for an eight digit number, the cube root of which works out exactly as a three digit number. Each letter represents only one digit and no digit is represented by two different letters. Note that the answer may contain any digit, whether already used or not. You may find a computer useful for this one.

MATCH PLAY

The diagram below shows an arrangement of matches. Can you do the following to this arrangement:

1. Remove 1 match to leave 4 squares.
2. Remove 2 matches leaving 3 squares.
3. Remove 3 matches leaving 5 squares.
4. Move 4 matches to make 11 squares.



(I was reminded about these match puzzles by Eric Day)

CROSSWORD?

Using the letters in **TIGHT TEATIME GAME**, complete this square in which the same five words read down as well as across.

```
CROSS
R....
O....
S....
S....
```

We come once again to the bit at the end that concludes this spot, and where I say thank you for joining me. Please don't forget the prize puzzles; keep 'em coming. Do you need more time, more help, more anything? If you have something to say, then write to me at the above address. Thank you to those who have written and entered the puzzles. If you sent an SAE you will get your disc/tape back eventually; please bear with me, thank you.

SOLUTIONS TO SEPTEMBER'S PUZZLES

Diamound:- I have given enough information for this to be worked out despite the mistake, but here is the answer: A=5, B=40, C=796, D=2318

Paragraph:- contained no "e", which is the most common letter in the English language

On Average:- 210 miles per hour.

Heads and Tails:- MAGNET

Point to Point:-
BAEDC
DCBAE
AEDCB
CBAED
EDCBA

Round Trip:- your answer is too big, go and look at the problem again. So you think you're right eh? Well the answer is after 27 months.

- * - * - * - * -

PRIZE PUZZLE No.8 - WINNERS AND THINGS

You probably know that I am a bit behind with these reports, but I'm getting there. I could just decide on the winners and print their programs, but would you want that? Do you find my ramblings on these problems of any use? Unfortunately, lack of space usually stops me from saying as much as I would like.

QUARRELSOME QUEENS

Only Six people sent in entries for this puzzle. If I don't start getting a lot more Bob will stop me running the Prize Puzzle. Are they too hard for you? If you don't write and tell me I can't change things can I?

Anyway, D.A.Lorner's entertaining program has the queens hitting each other over the head with various clubs and swords, before they are placed in their non-attacking positions. Unfortunately, all the placings are predetermined and not calculated. Nice graphics - shame about not using the computer to work out the problem set.

Roy Gardner and Craig Turberfield both took the random approach. That is, place a queen randomly on a row (starting with the first), then continually try to place a random queen on the next row until a position is found that is not in line with any other queens, and so on. If there is no such position, the programs start again at the first row. (I talk of rows, but columns can equally well be used). Both programs can do boards of all sizes.

Roy's checking of non-attacked squares, however, does not work on the diagonals, leaving some queens still able to quarrel. Craig's program checks the diagonals quite neatly by going in each of the four directions, starting from the current position. He uses LET r=r+(d=1)+(d=2)-(d=3)-(d=4), and LET c=c+(d=1)-(d=2)-(d=3)+(d=4), where r,c=current row/column and d=direction.

The other three entrants were D.Wood, Ettrick Thomson and Alan Cox. Alan's program has eight nested FOR-NEXT loops, one for the position of each queen (8x8 board only). At each loop a queen is prevented from being placed in an attacked position by comparing the new queen's position with all the other queens' positions; the difference in columns should not be the same as the difference in rows. Alan also provided a program to generate the solutions from the twelve basic ones by rotation and reflection. This produces 4 repeat solutions from the only symmetrical solution.

D.Wood's program finds all the solutions for boards of any size. The way it does this is to put the queens on the diagonal from bottom left to top right, and then moves the right hand queen of an attacking pair up, wrapping it round to the bottom if necessary. This is repeated, and the valid solutions occur when no queens are attacking. The most noticeable thing about this program is that for boards 6x6 and bigger it is very slow. It would seem that putting all the queens on the board to start with is not a good idea, probably because it means checking everything each time, instead of just checking that which is correctly placed.

Ettrick's program also finds all solutions for any size of board. It uses that powerful technique known as recursion, where a procedure is called from within itself. He actually sent in two programs, the second being faster than the first because of better handling of diagonals. I have decided that this program is the best, and thus award the prize to Ettrick, just claim your years free subscription next time you get a renewal notice through.

His program is reproduced below, and requires a bit of explanation. The clock procedure uses system variable FRAMES, which counts the no. of TV frames (50 per second). This variable is also on the the Spectrum at address 23672. Procedure 'show' prints two solutions at a time, the second one being the horizontal reflection of the first. This speeds the program up, but duplicate solutions need to be prevented: the first queen is restricted to one half of the board by rmax; if the number of queens is odd and the first queen is in the middle row (noted in row1) then the second queen must also be restricted to half of the board. This is checked in line 140, along with whether there are non-attacked rows in the column (row=0 if not). On exit from the procedure (caused by line 140) the program will of course return to where the procedure was called. For col=1 this will be line 70, and for col>1 it will be line 180; this is where the recursion comes in. When exiting the procedure, the variables row and col, which are local, revert to the values they had before the procedure was called.

The position of the queens is held in r$ as letters, ie. A=1, B=2, etc. Diagonal attack is looked after by diagup and diagdn, which record the presence of queens in the diagonals sloping up and the diagonals sloping down. In any up diagonal the difference between row and column is

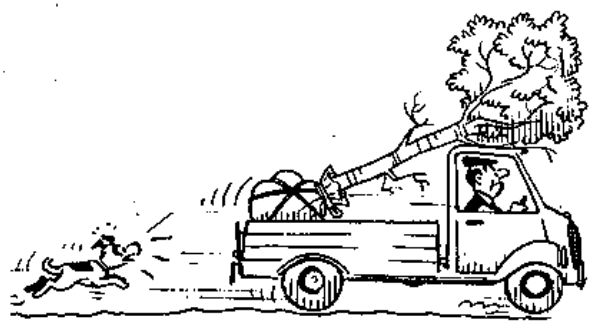
constant, ranging from 1-q to q-1 (q=no. of queens). To get a suitable array index, q is added, making the range 1 to 2q-1. Similarly, the sum of row and column is constant for the down diagonals. Thus the diagonals are easily identified, as in line 160. Diagonal attack is checked in line 150, a queen is placed in line 160, and line 180 deletes a queen when necessary.

```
  10 REM prize puzzle no.8. Quarrelso
     me Queens MkII. Ettrick Thomson.
  20 INPUT #2;"number of queens:";q
  30 clock 0: SCROLL CLEAR
  40 IF q MOD 2 THEN LET odd=1,rmax=1
     +q DIV 2: ELSE LET odd=0,rmax=q
     DIV 2
  50 DIM r$(q),diagup(2*q-1),diagdn(2
     *q): LET n=-1,row1=0
  60 place 1
  70 clock 1: SCROLL RESTORE
  80 STOP
 100 DEF PROC place col
 110 LOCAL row
 120 LET row=0: DO
 130 LET row=INSTR(row+1,r$," ")
 140 EXIT IF row=0 OR col=1 AND row>r
     max OR odd AND col=2 AND row1=rm
     ax AND row>rmax
 150 LOOP IF diagup(col-row+q) OR dia
     gdn(col+row)
 160 LET r$(row)=CHR$ (64+col),diagup
     (col-row+q)=1,diagdn(col+row)=1:
      IF col=1 THEN LET row1=row
 170 IF col=q THEN :show: ELSE :place
      col+1
 180 LET r$(row)=" ",diagup(col-row+q
     )=0,diagdn(col+row)=0
 190 LOOP
 200 END PROC
 300 DEF PROC show
 310 LET n=n+2: PRINT n; TAB 4;r$,
 320 FOR k=q TO 1 STEP -1
 330 PRINT r$(k);
 340 NEXT k: PRINT
 350 END PROC :
10000 DEF FN lo=DPEEK SVAR 632
10010 DEF FN hi=65536*PEEK (SVAR 632+2
      )
10020 DEF PROC clock q
10030 IF NOT q
10040 DPOKE SVAR 632,0: POKE SVAR 632+
      2,0
10050 ELSE
10060 LET lo1=FN lo,hi1=FN hi,lo2=FN l
      o
10070 IF lo1<lo2 THEN LET t=(lo2+FN hi
      )/50: ELSE LET t=(lo1+hi1)/50
10080 PRINT t DIV 60;":";t MOD 60
10090 END IF
10100 END PROC
```

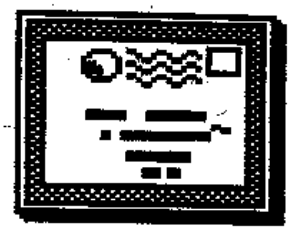
Apologies to Spectrum owners since you can't do recursion very easily. But especially for you, I have cobbled together a small program that will do the job as well, though not quite as fast as Ettrick's program. It is a bit inelegant, but I am sure you can improve it.

```
 10 INPUT "No. of queens? ";n
 20 DIM a$(n): LET a$(1)="1"
 30 LET a=2: LET q=2: LET c=1
 40 FOR t=1 TO a-1
 50 IF a$(t)=STR$ q THEN LET q=q+1: G
    OTO 40
 60 NEXT t
 70 IF q>n AND a=1 THEN STOP
 80 IF q>n AND a<>1 THEN GOTO 220
 90 LET ok=1
100 FOR t=1 TO a-1
110 IF a-t=ABS (VAL a$(t)-q) THEN LET
     ok=0
120 NEXT t
130 IF NOT ok THEN GOTO 200
140 LET a$(a)=STR$ q
150 LET a=a+1: LET q=1
160 IF a<=n THEN GOTO 40
170 PRINT c; TAB 4;a$
180 LET c=c+1
190 GOTO 220
200 LET q=q+1
210 IF q<=n THEN GOTO 40
220 LET a=a-1
230 LET q=VAL a$(a)+1
240 LET a$(a)=" "
250 GOTO 40
```

That's all folks, see you next time.



YOUR LETTERS



Dear Editor,

I am DELIGHTED to read the August issue. Ms.Carol Brooksbank's primer on Machine Code has really made my day! Over the years my efforts at comprehending Machine Code Programming have always been abortive. My hopes of mastering this voodoo art has soared again. Of late, I have noticed, that in your excitement with the new baby, SAM, poor "Ole' Speccy" was getting ignored. Carol Brooksbank has certainly resurrected the interest!

Although Spectrum+ 48K are now being assembled in India, the popularity is waning. With the steady decline of prices of PCs, the Graphics and Utility usage is shifting there. The Games area is being taken over by NINTENDOs. SAM has not appeared on the scene at all. Software update and support are also missing. I am one of the vanishing breed of Speccy users whose entire business operation still runs on two 128's and two Pluses, supported by two Disciples and four 3.5" drives and a host of peripherals. My word processing is on converted TW128, spreadsheets on modified Omnicalc, investments on Va#trak 6, database on Masterfile, and accounts upto P/L & Balance Sheet on custom-written software (in Basic, since I can't program in m/c code!), statistical packages of regression, moving average, and business graphics also custom written in Basic for the same reason as above! Under tutelage of Ms.Brooksbank, I might be able to make my programs efficient and also save on memory space.

Through the kind offices of my associates in the UK I have bought the software range of Betterbytes, and some from S.D.Software. But, I can't locate a more versatile spreadsheet, the Tascalc on tape has extremely poor I/O facilities and does not work on the disc! Nor can I get good statistical packages. I was told that Macmillan's had published good packages some time back. True? I badly need H-E-L-P! P-L-E-A-S-E!!

Arranging for foreign exchange is a major problem, but solvable! Hoping to hear from you soon, thru' FORMAT.

Yours sincerely, D.P.Dutta.

I can assure you that you are not our only reader in India and I know there are already a few SAMs in the country, still I understand your problems with software. If any reader can point Mr Dutta in the right direction I will be happy to pass on your letters.

Meanwhile I do not agree that we are neglecting the Spectrum. If you average the content over recent issues I think you will find the Spectrum gets just as much coverage as it always has. Remember that FORMAT has grown in size since the launch of SAM so that we can devote space to it without neglecting our loyal Spectrum followers. We may well expand further over the next few years as things develope. But mark my words, when I welcome in the new century on January 1st 2001 I still hope to be providing support for Spectrum users. **Ed.**

Dear Editor,

I wish to bring to your attention the (mis) use of FORMAT binders. I find they are ideal for keepig together all the handbooks and instructions for various hardware and software. Mine is filled with such a Unidos, Masterdos, Samdos, TLW, DISCiPLE, Plus D, Hackers Workbench and other instruction books and life is so much easier now I do not have to search for individual items.

Changing subjects. Why is it I wonder that the entrance fee to the All Formats Computer Show at Birmingham is £4 when a radio show at the same location, using the same

rooms cost only £1 to get in. I was also quoted £20 per 6' table space for the radio show, what do you get for £60 at a Computer show? Perhaps they think that "computers are up market so we can charge more" surely the cost of room hire is the same for all! It is possible many are "happy" to pay the £4 as they do not go to other shows so don't compare the entrance fee. They consider £4 normal whereas I go to many radio related events where £1 or 50p is "normal" some even have "free" entrance. Is it not in the exhibitors interest to put pressure on organizers to keep entrance fees low and so attract more customers?

Yours sincerely, Malcom Perry.

Well first, tnanks for the tip Malcom, I look forward to selling even more binders now.

On the subject of shows, I both agree and disagree. The All Formats Shows are the same as the radio events you talk about. Those are more often than not organized by amateur groups who are not looking to make much of a profit. They are also not nearly so well advertised.

Having said that, I do agree that £4 is a little extortionate for shows outside London. The average family of four can't afford those sort of price and, as many shows are now on Sundays, they should be for the family. Although lots of people do turn up I believe that a price drop would bring more people in and so result in larger profits for the organizers. What do other readers think? Ed.

Dear Editor,

I have just received my first FORMAT magazine and it is Brill. I am now hooked.

I was typing in the program labelled "BIORYTHEMS" in Vol.5 issue 1 onto my SAM. It worked well. The only thing I could moan about was the colour clash. I had not spent 300 on my SAM for colour clash. So for SAM owners just add the line:-

```
1 MODE4 : CSIZE 8,8
```

Now no colour clash.

Yours sincerely, E.P.Russell.

Dear Editor,

I have read the review of your FONT LIBRARY disc and would like to order a copy but what is the difference between the Spectrum version and the SAM version?

Yours sincerely, J.D.Gilroy.

You seem to have misunderstood the product Mr Gilroy. Both the FONT LIBRARY and the MONEY MANAGER discs are SAMSPEC - they work on both the SAM and the Spectrum (using DISCiPLE or PLUS D disc systems of course). There are some slight differences between the utility software on the FONT LIBRARY as SAM users don't need a character designer because there is one already in FLASH.

The idea behind SAMSPEC is that only one manual and one disc need to be kept in stock - both by us and by retailers - to serve both computer users. It also allows people to buy the software to use on their Spectrum know, and still enjoy the benefits when the upgrade to SAM in the future. Ed.

* - * - * - * - * - *

Letters may be shortened or edited to fit on these pages.

This is YOUR letters page so it is up to you, our readers, to fill it. Send your letters, on any subject you feel would interest other readers, to our usual address, keep them as short as you can so we can fit in as many as possible.

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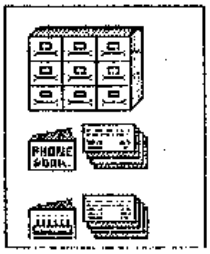

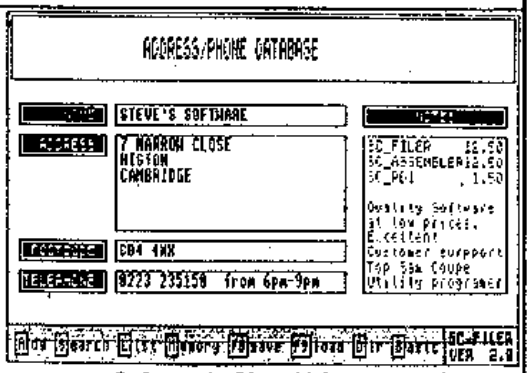

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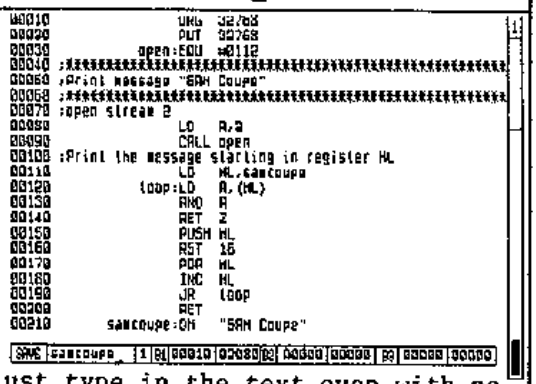

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